REMARKS

Claims 10-14 have been amended and new Claims 15-18 have been added. The application now includes Claims 10-18 with Claims 10, 12, 13 and 15 being the only independent claims. Favorable reconsideration, in view of the above amendments and accompanying remarks, is respectfully requested.

The courtesy of the Examiner in granting the applicant's attorney a telephone interview on February 27, 2004, is gratefully acknowledged. During the interview, proposed amendments to the claims and the cited references, including U.S. Patent No. 4,741,381 and applicants' admitted prior art, were discussed. With respect to the claims, it was discussed and agreed that the above amendments to independent Claims 10, 12 and 13 distinguishes over the cited references.

As amended, Claim 10 defines the invention as a method for filling a mold by a desired fill profile having at least four filling stages, stage 1, stage 2, stage 3 and stage 4, associated with four time intervals, t_0 to t_1, t_1 to t_2, t_2 to t_3, and t_3 to t_4, respectfully, and with four pressure change intervals, P_0 to P_1, P_1 to P_2, P_2 to P_3 and P_3 to P_4, respectively, to make a cast article comprising the steps of: (a) providing a molten metal to a casting chamber in fluid communication with the mold, the casting chamber having a supply conduit for introducing a gas into the casting chamber, and the casting chamber having an evacuation conduit for delivering the molten metal from the casting chamber to the mold; (b) controlling the filling of the mold during the first time interval t_0 to t_1 of stage 1 by delivering the molten metal from the casting chamber to the mold at a first rate by supplying the gas to the casting chamber during stage 1 at t_0 at P_0 and at t_1 at P_1 to allow the molten metal to rise at the first rate, stage 1 including an acceleration portion wherein the molten metal is accelerated up to a desired fill rate for stage 1, the first rate operative to produce a first stage actual fill profile; (c) controlling the filling of the mold during the second time interval t_1 to t_2 of stage 2 by delivering the molten metal from the casting chamber to the mold at a second rate by supplying the gas to the casting chamber during stage 2 at t_1 at P_1 and at t_2 at P_2 to allow the molten metal to rise at the second rate, the second rate operative to produce a second stage actual fill profile, the second rate being less than the first rate to thereby prevent the actual fill profile at the transition from the end of the first stage

actual fill profile to the beginning of the second stage actual fill profile from overshooting the desired fill profile and causing the molten metal to bounce and create turbulence in the mold whereby the mold fills more slowly with molten metal during stage 2 than during stage 1 to thereby produce a smooth transition in the filling of the mold cavity indicated graphically by a gradually decreasing slope value during the transition from the end of stage 1 to the beginning of stage 2; (d) controlling the filling of the mold during the third time interval t_2 to t_3 of stage 3 by delivering the molten metal from the casting chamber to the mold at a third rate by supplying the gas to the casting chamber during stage 3 at t_2 at P_2 and at t_3 at P_3 to allow the molten metal to rise at the third rate, the third rate being greater than the second rate whereby the mold fills more quickly with molten metal during stage 3 than during stage 2, the third rate operative to produce a third stage actual fill profile; and (e) controlling the filling of the mold during the fourth time interval t_3 to t_4 of stage 4 by delivering the molten metal from the casting chamber to the mold at a fourth rate by supplying the gas to the casting chamber during stage 4 at t_3 at P_3 and at t_4 at P_4 to allow the molten metal to rise at the fourth rate, the fourth rate operative to produce a fourth stage actual fill profile, the fourth rate being less than the third rate to thereby prevent the actual fill profile at the transition from the end of the third stage actual fill profile to the beginning of the fourth stage actual fill profile from overshooting the desired fill profile and causing the molten metal to bounce and create turbulence in the mold whereby the mold fills more slowly with molten metal during stage 4 than during stage 3 to thereby produce a smooth transition in the filling of the mold cavity indicated graphically by a gradually decreasing slope value during the transition from the end of stage 3 to the beginning of stage 4. None of the cited references, alone or in combination, discloses or suggests such a method as now recited in Claim 10. Accordingly, it is believed that Claim 10, along with dependent Claim 11, is patentable over the cited references.

Method Claim 12 has been amended in a manner similar to Claim 10. Thus, for those reasons discussed above with respect to Claim 10, it is believed that Claim 12 is patentable over the cited references.

Method Claim 13 has been amended in a manner similar to Claim 10. Thus, for those reasons discussed above with respect to Claim 10, it is believed that Claim 13, along with dependent Claim 14, is patentable over the cited references.

New method Claim 15 is similar to Claim 10 but only includes steps (a)-(c) therefrom. Thus, for those reasons discussed above with respect to Claim 10, it is believed that Claim 15, along with dependent Claims 16-18, are patentable over the cited references.

In view of the above amendments and accompanying remarks, it is believed that the application is in condition for allowance. However, if the Examiner does not believe that the above amendments to the claims place the application in condition for allowance, the undersigned attorney respectfully requests a telephone conference with the Examiner to discuss the application and the prior art references prior to the issuance of a final action by the Examiner.